

O. H. M. S.

W. J. Gerald
Deputy Minister.

LABORATORY
OF THE
INLAND REVENUE DEPARTMENT
OTTAWA, CANADA
BULLETIN No. 173
GROUND CLOVES

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Ground Cloves.

OTTAWA, February 6, 1908.

WM. HINSWORTH, Esq.,
Acting Deputy Minister of Inland Revenue.

SIR,— I beg to hand you a report upon the examination of 145 samples of Ground Cloves, collected throughout Canada during July and August of last year. The following synopsis shows the general results of the examination.

Inspection District.	Probably Genuine.	Found Doubtful.	Lost.	Total.
Nova Scotia.....	4	6	0	10
P. E. Island.....	6	4	0	10
New Brunswick.....	5	5	0	10
Quebec.....	6	4	0	10
St. Hyacinthe.....	3	7	0	10
Montreal.....	4	6	0	10
Ottawa.....	3	7	0	10
Kingston.....	3	5	2	10
Toronto.....	2	8	0	10
London.....	6	4	0	10
Windsor.....	4	1	0	5
Manitoba.....	7	3	0	10
Calgary.....	7	2	1	10
Vancouver.....	6	4	0	10
Victoria.....	8	2	0	10
	74	68	3	145

Total collected.....	Samples.
" analysed.....	145
" genuine.....	142
Percentage found genuine.....	74
	52 %

It will be noted that while I am able to declare 52 per cent. of the collection as probably genuine, I do not feel warranted in declaring adulteration as regards the remainder. This is due to uncertainty as regards the minimum limits of value for genuine cloves.

A study of cloves was made in this laboratory in 1900, and the results are published in Bulletin No. 73. The methods of examination there described have been mainly followed in the work now placed in your hands. So far as determinations of ash, fixed oil, tannin and total volatile matter are concerned, the well known processes have been employed. The distinction between that portion of the volatile matter which represents aqueous moisture, and that portion which represents volatile oil has been effected (as described in Bulletin 73) by drying *in vacuo* over sulphuric acid, to the point of incipient discoloration of the acid, and taking this loss to represent the moisture of the sample.

The mean values found for volatile oil, in 28 samples of genuine cloves, by this method, are as follows :—

(Bulletin 73, p. 14).

	Maximum.	Minimum.	Mean.
Penang Cloves.	17.2	14.8	16.2
Amboyna "	19.2	18.0	18.5
Zanzibar "	18.3	16.4	16.6
Mixture of these three kinds in equal proportion.	18.2	16.4	16.9
Values found by C. Richardson (Bull. 13, Bureau of Chemistry, Washington, 1887).	18.89	10.23	15.63

Cloves are defined by the Food Standards Committee of the United States (Circ. No. 19: Dept. of Agriculture, Washington, June 1906) as follows :—

"Cloves are the dried flower buds of *Caryophyllus aromaticus*, L.; which contain not more than five (5) per cent. of clove stems; not less than ten (10) per cent. of volatile ether extract; not less than twelve (12) per cent. of quercitannic acid; not more than eight (8) per cent. of total ash; not more than five-tenths (0.5) per cent. of ash insoluble in hydrochloric acid, and not more than ten (10) per cent. of crude fiber."

The "volatile ether extract" mentioned in this definition is not strictly identical with volatile oil, for the reason that it is determined on the cloves after drying by a method which involves a considerable, and an unknown loss of volatile oil. The limit of 10 per cent. for volatile ether extract, named in the definition, is certainly too low to apply to volatile oil. I have elsewhere (Bull. 73) suggested a minimum limit of 14 per cent. for "volatile oil" in cloves; and I am convinced that an inspection of this report will justify my recommendation. It is true that 17 samples classified as "probably genuine" yield less than 14 per cent. of volatile oil. The samples in question are as follows :—

No.	Volatile Oil.
31324	12.35
26489	13.65
26487	12.55
26472	11.55
29757	12.52
32635	12.95
32634	12.40
32626	13.10
183	13.00
35284	12.87
22668	12.80
35165	13.17
33160	12.02
33158	12.10
34320	13.17
35328	11.17
34957	11.37

The remaining 57 samples, similarly classified, yield percentages of volatile oil much higher than 14 and it is open to question whether samples showing less than this amount do not consist in whole or in part, of "exhausted cloves," that is, cloves from which the volatile oil has been removed in whole or in part.

Starch is present in 27 samples. This is not a normal component of clove. In a few cases the amount is so small that it may be present accidentally, but generally this assumption is not tenable. Pimento starch is usually the variety found; but sometimes wheat and maize have been identified. It must be remembered that this spice, while very frequently adulterated by addition of foreign matters, is capable of another kind of adulteration, namely, the removal of the whole or part of the volatile oil to which the spice owes its value.

The definition of Standard Ground Cloves must be written in such a way as to exclude both forms of adulteration. Such a definition is being considered.

I beg to recommend the publication of this report as Bulletin 173.

I have the honour to be, Sir,

Your obedient servant,

A. MCGILL,
Chief Analyst.

Date of Collection.	Nature of Sample.	No. of Sample.	Name and Address of Vendor.	Cost.		Name and Address of Manufacturer or Furnisher as given by the Vendor.	Inspector's Report.
				Quantity.	Cents.		

DISTRICT OF NOVA SCOTIA—

1908.							
Aug. 4	Ground Cloves	33501	DeWolf & Lamont, Kentville, N.S....	6 os..	15	F. F. Dalley Co., Hamilton.	Sample taken from Bulk.
" 5	" ..	33502	Shand Bros., Windsor.	3 pkgs	15	John P. Mott & Co., Halifax, N.S.	Warranted Superior Quality.
" 6	" ..	33503	Doyle & Co., Halifax.	3 "	15	W. H. Schwartz & Sons, Halifax, N.S.	Sold as Pure Peerless Brand.
" 6	" ..	33504	Nat. Drug Co., Halifax.	3 "	15	Nat. Drug Co. of Canada.	Labeled Sovereign Brand.
" 6	" ..	33505	John P. Mott & Co., Halifax.	3 "	Nie.	Jno. P. Mott & Co., Halifax.	Warranted Superior Quality.
" 6	" ..	33506	" " "	6 os..	"	" " "	" " "
" 7	" ..	33507	W. H. Schwartz & Sons, Halifax.	3 pkgs	13	W. H. Schwartz & Sons, Halifax.	Labeled Peerless Brand Pure.
" 7	" ..	33508	" " "	6 os..	11	" " "	" " "
" 7	" ..	33509	Creig & Hodgson, Halifax.	6 "	10	Can. Drug Co., St. John, N.B.	" " "
" 7	" ..	33510	W. C. Anderson, Halifax.	6 "	15	W. H. Schwartz & Sons, Halifax.	" " "

DISTRICT OF PRINCE EDWARD ISLAND—

July 15	Ground Cloves	31316	W. D. Currie, Souris.	6 os..	18	Dearborn & Co., St. John, N.B.	" " "
" 15	" ..	31317	Stern's Bros., Souris.	6 "	12	Nat. Drug Co., Halifax, N.S.	" " "
" 20	" ..	31318	Geo. Rackham, Charlottetown.	6 "	15	Carvell Bros., Charlottetown.	" " "
" 22	" ..	31319	J. D. Hume, Murray River.	6 "	18	Pure Gold.....	" " "
" 22	" ..	31320	A. M. Ross, Murray River.	6 "	24	Unknown	" " "
" 31	" ..	31321	M. & A. McLeod, Charlottetown.	6 "	15	J. A. Farquharson, Charlottetown.	" " "
Aug. 3	" ..	31322	Bowness & Myers, Bedeque.	6 "	15	Dearborn & Co., St. John.	" " "
" 3	" ..	31323	Aued & Co., Tree-town.	6 "	15	Chaput fils & Co., Montreal.	" " "
" 4	" ..	31324	W. J. Lidstone, Summerside.	6 "	12	Robert Greig & Co., Toronto.	" " "
" 5	" ..	31325	Stewart & Son, Charlottetown.	6 "	15	W. H. Schwartz & Sons, Halifax, N.S.	" " "

DISTRICT OF NEW BRUNSWICK—

July 16	Ground Cloves	29748	G. E. Barbour Ltd., St. John, N.B.	3 c'ts.	23	Vendors.....	"Acorn" Brand Strictly Pure Cloves guaranteed.
" 16	" ..	29749	" " "	6 os..	13	"	"Acorn" Brand..
" 16	" ..	29750	Dearborn & Co., St. John, N.B.	6 "	18	"	" " "
Aug. 5	" ..	29751	Geo. Robertson, Moncton, N.B.	6 "	15	Jno. P. Mott & Co., Halifax, N.S.	" " "

GROUND CLOVES.

Total Ash.	RESULTS OF ANALYSIS.								Remarks and Opinion of the Chief Analyst.
	Acid Insoluble Ash.	Volatile Matter.			Fixed oil Petroleum Ether Extraction.	Total Oil, Fixed and Volatile.	Tannin.	Microscopical Examination.	
		Water.	Oil.	Total.					

R. J. WAUGH, INSPECTOR.

p. e.		p. e.	p. e.	p. e.	p. e.	p. e.	p. e.		
6.75	0.50	3.80	12.88	16.69	2.27	15.07	....	Starch Clove Stems and Stone cells.	Foreign matter.
6.80	0.10	4.05	9.27	13.32	1.92	11.19	16.56	Clove Stems and Stone cells.	Vol. oil is low. Foreign matter.
5.66	0.20	3.62	17.49	21.11	1.55	20.50	.....	Clove tissues.....	Genuine.
5.07	0.10	3.85	15.30	19.15	1.97	17.77	.....	Clove Stems and Stone cells.	Foreign matter.
6.02	0.12	4.50	11.06	15.56	2.16	13.19	.....	" " "	"
6.35	0.20	3.42	13.72	17.14	2.50	16.22	.....	" " "	"
5.26	0.30	2.60	18.40	21.00	2.57	20.97	.....	Clove tissues.....	Genuine.
4.93	0.15	2.65	19.05	21.70	2.60	21.65	.....	Clove tissues.....	"
6.50	0.25	3.05	14.57	17.62	2.45	17.02	...	Clove Stems and Stone cells.	Foreign matter.
5.65	0.25	2.70	16.80	19.50	2.00	18.80	.....	Clove tissues.....	Genuine.

T. MOORE, INSPECTOR.

5.90	0.15	3.12	17.85	20.97	2.17	20.02	.....	Clove tissues.....	Genuine.
6.45	0.25	3.05	16.35	19.40	2.20	18.55	.....	Clove tissues.....	"
5.55	0.20	3.10	18.20	21.30	2.15	20.35	.....	Clove tissues.....	"
4.75	0.10	3.32	9.92	13.24	1.55	11.47	7.92	Wheat Starch, Clove Stems.	Tannin low; Foreign matter present.
4.92	0.50	4.02	10.85	14.87	1.47	13.32	.....	Clove Stems and Stone Cells.	Foreign matter.
6.45	0.60	3.67	10.62	14.29	2.32	11.94	.....	" " "	Ash: Acid insoluble Ash, are high. Foreign matter present.
7.60	0.50	4.32	11.32	15.64	3.72	15.04	.....	" " "	Foreign matter present.
5.80	0.20	2.30	18.40	20.70	1.15	19.55	.....	Clove tissues.....	Genuine.
7.50	0.35	3.82	12.35	16.17	1.10	13.45	.....	Clove tissues.....	"
5.70	0.30	3.07	17.67	21.24	1.40	18.97	...	Clove tissues.....	"

J. C. FERGUSON, INSPECTOR.

6.05	0.25	2.65	18.35	21.00	3.15	21.50	.....	Clove tissues.....	Genuine.
6.10	0.10	2.90	16.50	19.70	2.87	19.67	...	" " "	"
4.42	0.20	6.45	24.45	30.90	2.82	30.77	13.20	" " "	"
8.00	0.45	3.75	9.65	12.40	1.40	11.05	13.68	Clove Stems & Stone Cells	Vol. Oil is low. Foreign matter.

Date of Collection.	Nature of Sample.	No. of Sample.	Name and Address of Vendor.	Cost.		Name and Address of Manufacturer or Furnisher as given by the Vendor.	Inspector's Report.
				Quantity.	Cent.		

DISTRICT OF NEW BRUNSWICK—

1908.							
Aug. 6	Ground Cloves	29752	Miller Bros., New-castle, N.B.	6 c'tz.	10	Maritime Spice & Coffee Mills, St. John, N.B.	"Acorn" Brand..
" 7	"	29753	V. A. Danville, Chat-ham, N.B.	3 " "	30	H. W. Cole, Ltd., St. John, N. B. . .	"Thistle" Brand. Bowman & Cole's Spices are guaranteed to be pure.
" 13	"	29754	Inches & Grimmer, St. Stephen, N.B.	6 " "	15	Bowman and Cole, St. John, N. B. . .	
" 15	"	29755	H. C. Jewett, Fredericton, N.B.	6 " "	15	" " "	
" 18	"	29756	H. T. Noble, Woodstock, N.B.	6 " "	15	G. C. Bourbour & Co. Ltd., St. John, N. B.	
" 18	"	29757	R. E. Holyoke, Woodstock, N.B.	6 " "	15	Dearborn & Co., St. John, N.B.	

DISTRICT OF QUEBEC—

July 16	Ground Cloves	26472	Mederic Trambly, Baie St. Paul.	6 oz.	5	Whitead & Turner, Quebec.	
" 16	"	26477	Juste Jean, Baie St. Paul.	$\frac{1}{2}$ lb.	20	Turcotte & Frère, Quebec.	
" 17	"	26482	Benjamin Sinnard, Baie St. Paul.	6 oz.	8	Nazaire Turcotte & Cie, Quebec.	
" 17	"	26486	Alfred Otis, Baie St. Paul.	3 pkgs	27	N. Turcotte & Cie, Quebec.	
" 17	"	26487	Roger Bailly, Baie St. Paul.	6 oz.	12	" " "	
" 17	"	26488	P. N. Garielphy, Baie St. Paul.	6 " "	15	A. Carrier & fils, Lévis.	
" 24	"	26489	Joseph Falardeau, St. Joseph, P.Q.	6 " "	20	Quebec Spice Mills.	
" 24	"	26493	J. C. Delage, St. Joseph, P.Q.	6 " "	20	Unknown	
" 24	"	26495	Moise Pouliot, St. Joseph, P.Q.	6 " "	15	Lavoie & Dion, Quebec.	
" 24	"	26497	Alphonse Laroche, Dorchester, Quebec.	120 6 " "	15	Joseph & Sons, Quebec.	

DISTRICT OF ST. HYACINTHE—

July 29	Ground Cloves	175	Alfred Corneau, La Carrière, Bagot.	$\frac{1}{2}$ lb.	20	Raymond freres, St. Hyacinthe.	Labelled pure ground cloves.
" 29	"	176	L. J. Dubois, St. Dominique, Bagot.	6 oz.	15	L. Chaput & fils, Montreal.	
" 29	"	177	Mde. A. Roy, St. Pie, Bagot.	6 " "	15	Lacaille & Gendreau & Cie, Montreal.	
" 29	"	178	J. A. Messier, St. Paul, Abbotsford.	6 " "	15	L. Chaput fils & Co., Montreal.	Warranted pure cloves.
Aug. 4	"	179	F. X. Gagnon, Magog.	$\frac{1}{2}$ lb.	17	Hudon, Hobert & Cie, Montreal.	Labelled pure ground cloves.

GROUND CLOVES.

Total ash.	RESULTS OF ANALYSIS.									Remarks and Opinion of the Chief Analyst.
	Acid Insoluble Ash.	Volatile Matter.			Fixed oil, Petroleum Ether Extract.	Total Oil, Fixed and Volatile.	Tannin.	Microscopical Examination.		
		Water.	Oil.	Total.						
J. C. FERGUSON, INSPECTOR—Concluded.										
6.75	0.20	3.20	11.35	14.55	2.50	13.85	...	Clove Stems & Stone Cells	Foreign matter.	
8.65	0.30	3.25	9.35	12.60	3.30	12.65	10.04	" "	Ash is high; Vol. Oil is low; tannin is low.	
7.10	0.40	3.29	9.00	12.27	1.50	10.50	15.76	" "	Vol. Oil is low. Foreign matter.	
6.42	0.87	3.00	10.07	13.07	2.02	12.09	...	" "	Acid insoluble Ash is high. Foreign matter.	
5.75	0.25	3.15	19.72	22.87	2.27	21.99	17.16	Clove tissues	Genuine.	
7.02	0.42	3.77	12.52	16.29	3.00	15.52	.....	" .....	"

E. BELAND, INSPECTOR.

6.50	0.30	3.95	11.55	15.50	1.75	13.30	...	Clove tissues	Genuine.
5.15	0.10	4.42	21.10	25.52	1.55	22.65	..	"	"
9.00	2.87	4.80	9.23	14.03	0.77	10.00	13.20	Ginger, Starch and Stone Cells.	Ash. Acid insoluble Ash. high. Vol. Oil is low. Foreign matter present.
6.70	0.95	2.60	8.50	11.10	1.55	9.55	13.68	Clove Stems, Stone Cells & Coconut Stone Cells	Acid insoluble Ash. high. Vol. Oil low. Foreign matter present.
7.15	0.50	4.70	12.55	17.25	1.15	13.70	.....	Clove tissues	Genuine.
6.82	0.47	5.90	15.05	20.95	1.22	16.27	....	"	"
6.70	0.45	5.02	13.65	18.67	1.05	14.70	.....	"	"
4.30	0.50	5.05	5.42	10.47	1.37	6.79	11.04	Starch and a few Clove Stone Cells.	Vol. Oil very low. Tannin low. Foreign matter.
6.95	0.40	4.07	14.40	18.47	2.45	16.85	.....	Clove tissues	Genuine.
6.45	0.95	4.70	9.80	14.55	2.05	11.85	13.65	Starch and Clove Stems.	Acid insoluble Ash. high. Vol. Oil is low. Foreign matter.

J. C. ROULEAU, INSPECTOR.

6.50	0.45	4.05	9.35	13.40	1.35	10.70	11.04	Wheat or corn starch, clove stems and stone cells.	Vol. oil low. Tannin low. Foreign matter.
5.45	0.20	4.57	16.27	20.84	1.82	18.09	.....	Clove tissues	Genuine.
7.45	0.45	3.65	11.90	15.55	1.80	13.70	.....	Clove stems	Too many stems.
5.20	0.19	4.35	17.22	21.57	2.45	19.67	....	Clove tissues	Genuine.
4.65	0.50	4.60	7.80	12.40	0.85	8.65	7.90	Wheat starch, clove stems and stone cells.	Vol. oil low. Tannin low. Foreign matter.

Date of Collection.	Nature of Sample.	No. of Sample.	Name and Address of Vendor.	Coer.		Name and Address of Manufacturer or Furnisher as given by the Vendor.	Inspector's Report.
				Quantity.	Cents.		

DISTRICT OF ST. HYACINTHE—

1908.							
Aug. 4	Ground Cloves	180	E. J. Esty & Co., Eastman.	$\frac{1}{2}$ lb..	18	Mathewson's Sons, Montreal.	
" 5	"	181	Paradis & Leclair, Sherbrooke.	3 pkg.	24	Heron & LeBlanc, Ltd., Montreal.	
" 10	"	182	Raymond & freres, St. Hyacinthe.	6 os..	10	Not known..	
" 10	"	183	Albert Cadieux, St. Hyacinthe.	$\frac{1}{2}$ lb..	20	Lacaille, Gendreau & Cie, Montreal.	Labelled pure ground cloves.
" 11	"	184	E. Coutu, Sorel.....	$\frac{1}{2}$ " ..	20	Laporte, Martin & Cie, Ltd., Montreal.	Labelled pure cloves.

DISTRICT OF MONTREAL—

July 18	Ground Cloves	32626	Gravel freres, St. Catherine W., Montreal.	6 os..	15	S. H. Ewing & Sons, Montreal.	
" 20	"	32627	E. Dion, Valleyfield, P.Q.	6 " ..	15	Not given	
" 20	"	32628	Leduc et freres, Valleyfield, P.Q.	6 " ..	15	Hudon Orsali, Montreal.	
" 22	"	32629	J. R. McQuat, Lachute, P.Q.	6 " ..	13	Not given	Sold as pure
" 22	"	32630	H. J. Giles & Bro., Lachute, P.Q.	6 " ..	10	Mathewson's Sons, Montreal.	
" 26	"	32631	G. Racine, Point Clair, P.Q.	6 " ..	15	Hudon Hebert & Co., Montreal.	
" 30	"	32632	J. A. Simard & Co., St. Paul St., Montreal.	$\frac{1}{2}$ lb..	10	Vendors	
" 30	"	32633	J. V. Boudrias, Notre Dame W., Montreal	6 os..	10	Vendor	
" 30	"	32634	Nat. Coffee and Spice Co., St. Paul St., Montreal.	$\frac{1}{2}$ lb..	15	Vendors	After completion of sale vendor stated that sample was sold as commercially pure, but contained 50 p.c. Clove Stems.
" 30	"	32635	E. C. McCoy, Huntingdon, P.Q.	6 os..	15	F. F. Dalley Co., Hamilton.	

DISTRICT OF OTTAWA—

July 11	Ground Cloves	22668	J. B. Kemp, Pembroke, Ont.	6 os..	10	Pure Gold Mfg. Co., Toronto.	Sold as ground cloves.
" 14	"	22669	Hare & McInnis, Ironquais, Ont.	6 " ..	15	Gilmour & Co., Brockville.	Taken from a tin labelled "Cloves Bison Brand." Goods were guaranteed. Sold as ground cloves.
" 14	"	22670	W. P. Walker, Cardinal, Ont.	6 " ..	12	Dalton Bros., Toronto, Ont.	Taken from a tin marked "Bison Brand." Goods are guaranteed. Sold as ground cloves.

GROUND CLOVES.

Total Ash.	RESULTS OF ANALYSIS.								Remarks and Opinion of the Chief Analyst.
	Acid Insoluble Ash.	Volatile Matter.			Fixed oil Petroleum Ether Extraction.	Total Oil, Fixed and Volatile.	Tannin.	Microscopical Examination.	
		Water.	Oil.	Total.					
J. C. ROULEAU, INSPECTOR—Concluded.									
p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.		
8.75	0.50	3.90	11.42	15.32	1.22	13.64	...	Clove stems and stone cells.	Ash too high. Foreign matter.
3.30	0.40	2.77	10.85	13.62	1.90	12.75	.....	Clove tissues; stems in excess.	Excess of stems.
5.15	0.20	3.40	9.85	13.25	0.45	10.30	7.20	Wheat starch, clove stems and stone cells.	Vol. oil low. Tannin low. Foreign matter.
7.20	0.20	3.55	13.00	16.55	1.70	14.70	.....	Clove tissues.....	Genuine.
4.72	0.60	4.10	6.77	10.87	2.62	9.39	7.44	Wheat and corn starch and clove stems.	Acid insoluble ash high. Vol. oil is low; tannin low. Foreign matter.

J. J. COSTIGAN, INSPECTOR.

7.02	0.42	3.67	13.10	16.77	1.37	14.47	.....	Clove tissues.....	Genuine.
6.92	0.50	4.25	8.65	12.90	1.52	10.17	11.26	Clove stems and stone cells.	Vol. oil is low. Tannin low. Foreign matter.
6.10	0.50	4.50	10.95	15.45	2.27	13.23	...	" " ..	Foreign matter.
5.75	0.30	3.75	10.42	14.17	2.10	12.52	.....	Starch, clove stems and stone cells.	"
8.00	0.47	4.07	10.17	14.24	2.35	12.52	.....	Clove stems and stone cells.	"
4.20	0.35	4.62	6.58	11.20	2.45	9.08	6.00	Starch, some clove stems and stone cells.	Vol. oil is low. Tannin low. Foreign matter.
6.72	0.25	3.77	13.80	17.57	3.07	16.87	.....	Clove tissues.....	Genuine.
5.95	0.15	3.92	11.07	14.99	2.32	13.30	.....	Starch, clove stems and stone cells.	Foreign matter.
7.37	0.47	4.02	12.40	16.42	1.72	14.12	.....	Clove tissues.....	Genuine.
5.75	0.20	3.90	12.95	16.85	2.43	15.38	.....	" .....	"

J. A. RICKEY, INSPECTOR.

6.37	0.30	2.40	12.80	15.20	2.17	14.97	.....	Clove tissues.....	Genuine.
6.60	0.25	3.07	8.06	11.15	0.80	8.88	7.92	Wheat starch, clove stems and stone cells.	Vol. oil low. Tannin low. Foreign matter present.
6.05	0.20	2.90	10.65	13.55	0.50	11.15	.....	" " ..	Foreign matter present.

Date of Collection.	Nature of Sample.	No. of Sample.	Name and Address of Vendor.	Cost.		Name and Address of Manufacturer or Furnisher as given by the Vendor.	Inspector's Report.
				Quantity.	Cents.		

DISTRICT OF OTTAWA—

1899.							
July 18	Ground Cloves	22671	John Simpson & Son, Alexandria, Ont.	6 oz.	12	Not known	Taken from a tin marked cloves. Sold as ground cloves.
" 18	"	22672	G. Deguire, Glen Robertson, Ont.	6 "	12	Laporte, Martin & Co., Montreal	From a box marked pure cloves. Sold as ground cloves.
" 24	"	22673	A. Cochrane, Florence St., Ottawa, Ont.	6 "	20	Unknown	From bulk. Sold as ground cloves.
" 24	"	22674	Ellis Bros., Somerset St., Ottawa, Ont.	6 "	20	"	Sold as ground cloves.
" 24	"	22675	R. Baird, Somerset St., Ottawa, Ont.	6 "	20	Not known	"
" 24	"	22676	Bate & Co., Bank St., Ottawa, Ont.	6 "	24	"	"
" 25	"	22677	G. F. Hodgins, Shawville, P.Q.	6 "	20	Pure Gold Mfg. Co., Toronto, Ont.	"

DISTRICT OF KINGSTON—

July 22	Ground Cloves	35275	J. E. Harker, Belleville, Ont.	6 oz.	15	R. Grig, Toronto	
" 22	"	35276	G. Pearson, Belleville, Ont.	6 "	15	"	
" 22	"	35277	J. H. P. Young, Belleville, Ont.	6 "	15	Pure Gold, Toronto	
" 22	"	35278	W. T. Patterson, Belleville, Ont.	6 "	15	C. H. Cochrane & Co., Ottawa	
" 22	"	35279	S. Fourn, Port Hope	6 "	15	W. H. Gilard & Co., Hamilton	
" 23	"	35280	J. E. Lillico, Peterboro, Ont.	6 "	15	Pearking & Iver, Peterboro	
" 23	"	35281	W. J. Routly, Peterboro, Ont.	6 "	15	C. Richer, Peterboro	
" 23	"	35282	W. H. Hamilton, Peterboro, Ont.	6 "	25	Todhunter & Mitchell, Toronto	
" 23	"	35283	P. Connal & Son, Peterboro, Ont.	6 "	25	"	
" 23	"	35284	R. H. Hunter, Peterboro, Ont.	6 "	25	"	

DISTRICT OF TORONTO—

July 31	Ground Cloves	35144	Andrew Foster, St. Catharines.	6 oz.	15	Unknown	Vendor said he bought it for pure stock.
Aug. 5	"	35145	J. J. McQuarrie, Hamilton.	6 "	15	F. F. Dalley & Co., Ltd., Hamilton	
" 7	"	35146	W. G. Monet, Port Perry.	6 "	25	Not known	Sample was purchased with a general stock of groceries at Enniskillen.
" 7	"	35147	McDowell & Co., Oshawa	6 "	25	Todhunter Mitchell Co., Toronto	
" 8	"	35148	J. C. Waterhouse, Whitby.	6 "	15	The Robt. Greig Co., Ltd., Toronto	

GROUND CLOVES.

Total Ash.	RESULTS OF ANALYSIS.									Remarks and Opinion of the Chief Analyst.
	Acid Insoluble Ash.	Volatile Matter.			Fixed Oil, Petroleum Ether Extraction.	Total Oil, Fixed and Volatile.	Tannin.	Microscopical Examination.		
		Water.	Oil.	Total.						
J. A. RICKEY, INSPECTOR—Concluded.										
p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.		
7.27	0.20	2.35	14.00	16.65	2.07	16.07	.....	Clove tissues.....	Genuine.	
7.62	0.50	2.35	11.27	13.62	2.37	13.64	.....	Clove stems.....	Foreign matter.	
7.30	0.45	2.85	11.30	14.15	2.00	13.30	.....	Few clove stems, &c....	Foreign matter in small amount.	
2.62	0.20	5.20	9.15	12.35	1.25	10.40	4.80	Starch, &c....	Vol. oil low. Tannin low.	
8.00	0.50	2.65	10.97	13.62	1.95	12.92	.....	Clove stems.....	Foreign matter (clove stems).	
6.15	0.17	2.85	16.80	19.65	1.12	17.92	.....	Clove tissues.....	Genuine.	
5.07	0.50	3.97	7.78	11.75	1.45	9.23	12.24	Wheat starch....	Vol. oil low. Foreign matter.	
J. HOGAN, INSPECTOR.										
6.25	0.20	2.72	13.25	15.97	2.35	15.60	.....	Clove stems and long stone cells.	Foreign matter.	
6.75	0.50	2.85	14.60	17.45	2.40	17.00	.....	Clove tissues.....	Genuine.	
5.85	0.20	2.50	17.10	19.60	2.95	20.05	.....	".....	"
7.80	0.95	2.20	9.62	12.82	1.17	10.79	13.44	Clove stems and stone cells.	Acid insoluble ash high; vol. oil low. Foreign matter.	
6.27	0.40	2.97	9.06	12.05	1.75	10.83	12.60	Clove stems, stone cells, starch.	Spoiled by bad packing of our inspector.	
7.90	0.25	4.50	7.40	11.90	1.35	8.75	14.64	Clove stems and stone cells.	Vol. oil low. Foreign matter.	
7.80	1.05	3.32	10.12	13.42	2.50	12.62	.....	Clove stems and stone cells.	"	
6.60	0.20	3.25	12.87	16.12	2.67	15.64	.....	Clove tissues.....	As in 35279.	
6.60	0.20	3.25	12.87	16.12	2.67	15.64	.....	Clove tissues.....	Acid insoluble ash is high. Foreign matter.	
6.60	0.20	3.25	12.87	16.12	2.67	15.64	.....	Clove tissues.....	Genuine.	
H. J. DAGER, INSPECTOR.										
6.40	0.50	4.05	11.50	15.65	2.80	14.30	.....	Starch, clove stems and stone cells.	Foreign matter.	
5.85	0.25	3.90	10.12	14.05	1.47	11.59	.....	Starch.....	"	
6.45	0.25	3.45	12.77	16.25	2.40	15.17	.....	".....	"
6.95	0.60	3.55	10.20	13.75	3.05	13.25	.....	Clove stems and stone cells.	Acid insoluble ash is high. Foreign matter.	
8.09	0.70	3.60	11.05	14.65	2.90	13.95	.....	"	"

Date of Collection.	Nature of Sample.	No. of Sample.	Name and Address of Vendor.	Cost.		Name and Address of Manufacturer or Furnisher as given by the Vendor.	Inspector's Report.
				Quantity.	Cents.		

DISTRICT OF TORONTO—

Aug. 11	Ground Cloves	35164	A. M. Rinher, Wel-	6 os..	15	Unknown.....	
" 11	"	35165	land. Ford & Brittin, Wel-	6 " ..	15	Todhunter Mitchell	
" 12	"	35166	land. John Hickman, To-	6 " ..	15	Co., Toronto.	
" 12	"	35167	ronto. E. A. Kendall, Toronto	6 " ..	15	" "	
" 12	"	35168	E. A. Kendall, Toronto	6 " ..	15	Dalton Bros., Toronto	Sample was taken from tin labelled Dalton Bros. Cloves. B. Vendor said sample was Dalton's Cloves.
" 12	"	35168	E. Wilts, Toronto...	6 " ..	15	" "	Taken from stock tin, labelled Dalton Bros. Cloves.

DISTRICT OF LONDON—

July 15	Ground Cloves	30839	Sturday & Co., God-	6 os..	15	Gorman & Eckart,	
" 15	"	30840	ich. F. J. Buttand, God-	6 " ..	15	London.	
" 16	"	30844	ich. Michael Klinghamer,	6 " ..	15	Dom. Drug Co., God-	
" 20	"	30851	Dublin, Ont.	6 " ..	15	erich.	
" 21	"	30853	Mathew Williams,	6 " ..	15	Gorman & Eckart,	
" 21	"	30856	Seaforth.	6 " ..	15	London.	
" 21	"	30856	A. Beattie & Co.,	6 " ..	15	F. F. Dalley & Co.,	
" 22	"	30862	Stratford.	6 " ..	15	Hamilton.	
" 22	"	30862	A. F. Lloyd, Strat-	6 " ..	15	Gorman Eckart & Co.,	
" 29	"	30869	ford.	6 " ..	15	London.	
" 31	"	30870	J. A. Stewart, Exeter.	6 " ..	15	" "	
" 31	"	30873	George Thompson,	6 " ..	15	Unknown.....	
" 31	"	30873	Brussels.	6 " ..	15	Todhunter & Mitchell	
" 31	"	30870	Mr. Stewart, Stratford	6 " ..	15	Toronto.	
" 31	"	30873	J. D. Smith, St. Marys	6 " ..	15	Canada Spice Co., To-	
" 31	"	30873		6 " ..	15	ronto.	
" 31	"	30873		6 " ..	15	Not known.....	

DISTRICT OF WINDSOR—

Aug. 11	Ground Cloves	34588	Gorman Eckert & Co.,	3 car-	20	Vendors.....	Taken from stock
" 11	"	34590	London.	tons.	25	"	in factory.
" 12	"	34592	Canada Spice & Gro-	2 lb..	25	"	" "
" 12	"	34592	cery Co., London.	9 os..	45	Not known.....	
" 12	"	34595	G. T. Carley, Lambeth	9 " ..	25	Red Feather Co.,	Packed and milled
" 13	"	34598	for Red Feather	9 " ..	45	Hamilton.	Co.
" 13	"	34598	Co.	9 " ..	45	Not known.....	

GROUND CLOVES.

Total Ash.	RESULTS OF ANALYSIS.								Microscopical Examination.	Remarks and Opinion of the Chief Analyst.
	Acid Insoluble Ash.	Volatile Matter.			Fixed oil, Petrolic Ether Extraction.	Total Oil, Fixed and Volatile.	Tannin.			
		Water.	Oil.	Total.						

H. J. DAGER, INSPECTOR—Concluded.

p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.				
6.00	0.33	3.63	13.57	17.19	3.35	16.83	10.08	Wheat starch and clove stems.	Tannin low. Foreign matter.	
7.00	0.25	3.47	13.17	16.64	2.80	15.07		Clove tissues.....	Genuine.	
6.50	0.65	3.35	16.57	19.92	2.23	18.79		Ginger, starch	Acid insoluble ash is high. Foreign matter in trace.	
5.72	0.10	3.35	18.87	22.12	1.90	20.77	16.32	Clove tissues.....	Genuine.	
5.10	0.25	3.35	15.30	18.45	1.32	16.52		Wheat starch and clove stems.	Foreign matter.	

T. KIDD, INSPECTOR.

5.02	0.35	3.57	16.95	20.52	2.15	19.10		Clove tissues.....	Genuine.	
6.85	0.30	3.10	14.25	17.35	2.30	18.55		"	"	
6.25	0.45	3.35	14.47	17.93	2.00	16.47		"	"	
6.30	0.35	3.00	13.85	16.75	1.75	14.60		Clove stems and stone cells.	Foreign matter.	
6.10	0.10	2.82	16.10	18.92	3.90	20.00		Clove tissues.....	Genuine.	
6.25	0.30	3.47	16.95	20.42	3.27	19.22		"	"	
6.12	0.15	2.83	13.90	16.73	1.62	15.62		Some starch and clove stems.	Foreign matter.	
7.50	0.97	3.45	13.65	16.50	3.02	16.07		Clove stems and stones.	Acid insoluble ash is high. Foreign matter in small amount.	
5.55	0.15	2.70	20.25	23.05	1.87	22.12		Clove tissues.....	Genuine.	
7.85	0.85	4.05	8.77	12.82	1.35	10.12	11.28	Starch, clove stems and stone cells.	Acid insoluble ash high. Vol. oil low. Tannin low. Foreign matter.	

JOHN TALBOT, INSPECTOR.

5.60	0.40	3.97	19.65	23.62	3.05	21.70		Clove tissues.....	Genuine.	
5.60	0.10	4.60	20.00	24.60	3.20	23.20		"	"	
5.22	0.12	3.55	17.05	20.60	1.30	18.35		"	"	
5.45	0.40	3.45	19.12	22.57	1.65	20.77	13.44	"	"	
6.40	0.50	3.62	10.72	14.34	2.15	12.57		Clove tissues and a few stone cells.	Small quantity of foreign matter.	

Date of Collection.	Nature of Sample.	No. of Sample.	Name and Address of Vendor.	Cost.		Name and Address of Manufacturer or Furnisher as given by the Vendor.	Inspector's Report.
				Quantity.	Cents.		

DISTRICT OF MANITOBA—

1908.							
Aug. 8	Ground Cloves	33157	Otto Schultz, Gretna.	6 oz.	50	Not known.....	
" 8	"	33158	E. Penner & Co., Gretna.	6 " "	25	Thompson Bradshaw & Co., Toronto.	
" 10	"	33159	J. A. Becker, Pilot Mound.	6 " "	20	Not known.....	
" 10	"	33160	J. G. McLean & Co., Pilot Mound.	3 pkg.	30	Todhunter Mitchell & Co., Toronto.	Strictly pure selected cloves.
" 10	"	33161	D. S. McKay, Pilot Mound.	6 oz.	15	Not given	
" 11	"	33162	P. Winram & Co., Manitou.	3 pkg.	45	The Codville Co., Winnipeg.	Gold standard pure spice.
" 11	"	33163	J. Wooten, Manitou.	3 " "	25	The Blue Ribbon Ltd., Winnipeg.	
" 12	"	33164	Campbell Bros. & Wilson, Winnipeg.	3 " "	19	G. L. Dunn & Co., Hamilton.....	Royal Shield brand of goods. Cloves.
" 12	"	33165	The Blue Ribbon Ltd., Winnipeg.	6 oz.	no chg.	Vendor.....	
" 13	"	33166	The Jobin Marrin Co. Ltd., Winnipeg.	6 " "	10	"	

DISTRICT OF CALGARY—

Aug. 14	Ground Cloves	35321	L. T. Mewburn, Calgary.	3 tins.	25	Red Feather, Hamilton.	
" 14	"	35322	Tuxedo Coffee & Spice Mills, Calgary.	3 pkg.	25	Vendors.....	
" 17	"	35323	R. Dunn, Medicine Hat.	3 tins.	30	F. F. Dalley Co., Hamilton.	
" 17	"	35324	D. Milne Co., Ltd., Medicine Hat.	3 " "	30	Blue Ribbon Mfg. Co., Winnipeg.	
" 19	"	35325	Hudson Bay Co., Lethbridge.	3 " "	30	Unknown	
" 19	"	35326	Bentley Co., Ltd., Lethbridge.	3 " "	36	Imperial Spice Co., Hamilton.	
" 22	"	35327	Wilkin & Jones, Fort Saskatchewan.	3 " "	30	Red Feather Co., Hamilton.	
" 22	"	35328	Shera & Co., Fort Saskatchewan.	3 " "	30	The Dyson Co., Winnipeg.	
" 25	"	35329	Hudson Bay Co., Edmonton.	3 " "	30	Unknown.....	
" 25	"	35330	Acme Co., Ltd., Edmonton.	3 " "	30	Hamilton Coffee & Spice Co., Hamilton.	

DISTRICT OF VANCOUVER—

July 31	Ground Cloves	34315	C. E. Turner, Vancouver.	3 tins.	30	Kelly, Douglas & Co., Vancouver.	Guaranteed finest quality and full strength.
" 31	"	34316	J. F. May, Vancouver.	6 oz.	15	W. Braid & Co., Vancouver.	
" 31	"	34317	Baitig & Petch, Vancouver.	6 " "	15	Empress Mfg. Co., Vancouver.	
" 31	"	34318	The White Thomson Co., Vancouver.	3 tins.	30	" " "	Empress Brand. ..

GROUND CLOVES

RESULTS OF ANALYSIS.										Microscopical Examination.	Remarks and Opinion of the Chief Analyst.
Total Ash.	Acid Insoluble Ash.	Volatile Matter.			Fixed oil Petroleum Ether Extraction.	Total Oil Fixed and Volatile.	Tannin.				
		Water.	Oil.	Total.							

A. C. LARIVIERE, INSPECTOR.

p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.			
6.10	0.10	3.03	13.90	16.93	2.87	16.77	.....	Clove tissues	Genuine.		
6.40	0.40	3.42	12.10	15.52	4.17	16.27	.....	" .....	"	
5.00	0.12	3.30	17.05	21.25	3.06	19.96	.....	" .....	"	
7.05	0.40	4.32	12.62	16.34	1.62	13.64	.....	" .....	"	
7.42	0.35	3.87	11.40	15.27	2.50	13.90	.....	Clove stems	Too many stems.		
5.25	0.10	4.22	20.55	24.77	2.20	22.75	.....	Clove tissues	Genuine.		
6.10	0.50	3.15	20.62	23.77	1.13	21.77	.....	" .....	"	
6.45	0.50	3.03	11.85	15.80	0.62	12.47	.....	Clove stems and stone cells.	Foreign matters of small amount.		
5.50	0.20	2.85	20.57	23.42	1.07	21.64	.....	Clove tissues	Genuine.		
7.10	0.50	4.15	10.65	14.80	1.90	12.55	.....	Clove tissues and a few stone cells.	Foreign matter in small amount.		

R. W. FLETCHER, INSPECTOR.

5.85	0.10	3.00	17.32	20.32	0.80	18.12	.....	Clove tissues.....	Genuine.
5.00	0.20	3.65	16.50	20.15	2.22	18.72	.....	" .....	"
6.55	0.85	4.60	12.70	17.30	1.35	14.05	.....	" .....	Acid insoluble ash is high.
.....	.....	.....	.....	.....	.....	.....	.....	.....	Lost through bad packing
5.12	0.17	3.45	18.75	22.20	1.00	19.75	.....	Clove tissues	Genuine.
7.87	0.50	4.60	11.32	15.92	1.20	12.52	.....	Clove stems and stone cells.	Foreign matter.
5.43	0.32	3.10	22.55	25.65	4.10	26.65	.....	Clove tissues.....	Genuine.
7.06	0.37	3.72	11.17	14.89	1.95	13.12	.....	" .....	"
6.25	0.20	3.50	15.12	18.62	2.20	17.32	.....	" .....	"
5.90	0.12	4.25	16.20	20.45	1.65	17.85	...	"	"

J. F. POWER, INSPECTOR.

5.20	0.20	2.72	22.75	25.47	1.85	24.60	14.40	Clove tissues.....	Genuine.
3.10	0.15	2.80	10.00	12.80	2.50	12.50	...	Wheat starch, clove stems and stone cells.	Foreign matter.
5.00	0.10	2.97	14.97	17.94	1.95	16.92	....	" " ..	"
7.35	0.45	3.37	13.00	17.27	2.32	16.22	....	Clove tissues.....	Genuine.

Date of Collection.	Nature of Sample.	No of Sample.	Name and Address of Vendor.	Cost.		Name and Address of Manufacturer or Furnisher as given by the Vendor.	Inspector's Report.
				Quantity.	Cts.		

DISTRICT OF VANCOUVER—

1908.							
July 31	Ground Cloves	34319	Webster Bros., Vancouver.	6 oz.	15	Todhunter Mitchell & Co., Toronto.	.....
" 31	"	34320	Howell & Weir, Vancouver.	6 "	20	Pioneer Coffee & Spice Mills, Victoria, B.C.	.....
Aug. 1	"	34321	Healby & Jackson, Vancouver.	3 tins.	30	E. R. Durke & Co., New York, U.S.A.	Guantlet Brand Guaranteed under Food and Drugs Act.
" 1	"	34322	H. J. Hampton, Vancouver.	6 oz.	15	Dalton Bros., Toronto	.....
" 4	"	34323	Empress Mfg. Co., Vancouver.	9 "	15	Unknown	Purchased at the factory.
" 4	"	34324	W. Braid & Co., Vancouver.	9 "	15	Vendors	"

DISTRICT OF VICTORIA—

July 21	Ground Cloves	34947	Windsor Grocery Co.	3 cartons.	45	Pioneer Coffee & Spice Mills, Victoria, B.C.	Extra quality cloves.
" 21	"	34953	Saunders Grocery Co., Ltd.	3 "	25	E. R. Durke & Co., New York, U.S.A.	Durke's Guantlet Brand Cloves.
" 23	"	34955	Victoria Coffee & Spice Mills, Victoria, B.C.	3 "	30	Victoria Coffee & Spice Mills, Victoria, B.C.	Victoria Brand Pure Cloves.
" 25	"	34957	Fred Carne	3 pkts.	30	Braid, Vancouver, B.C.	Braid's Cloves
" 23	"	34958	"	6 oz.	25	Pioneer Coffee & Spice Mills, Victoria, B.C.	.....
" 23	"	34961	West End Grocery Co., Ltd.	3 cartons.	45	Victoria Coffee & Spice Mills, Victoria, B.C.	Victoria Brand Pure Cloves.
" 23	"	34962	"	6 oz.	10	Todhunter Mitchell & Co., Toronto, Ont.	.....
" 23	"	34965	J. W. Speed	3 cartons.	30	Blue Ribbon Mfg Co., Winnipeg, Man.	Blue Ribbon Pure Cloves.
" 23	"	34966	W. O. Wallace	3 "	45	A. Shilling & Co., San Francisco, Cal.	Shilling's best Cloves.
" 24	"	34969	Dixie H. Ross & Co.	3 "	30	Todhunter Mitchell & Co., Toronto, Ont.	Dixie H. Ross and Co's. Pure Cloves

GROUND CLOVES.

RESULTS OF ANALYSIS.									Remarks and Opinion of the Chief Analyst.
Total Ash.	Acid Insoluble Ash.	Volatile Matter.			Fixed oil, Petroleum Ether Extraction.	Total Oil Fixed and Volatile.	Tannin.	Microscopical Examination.	
		Water.	Oil.	Total.					

J. F. POWER, INSPECTOR—Continued.

p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.		
6.10	0.15	3.80	15.85	19.65	1.70	17.55	...	Cloves tissues.....	Genuine.
4.55	0.10	3.25	13.17	16.42	2.07	15.24	...	"	"
6.10	0.27	2.80	21.30	24.10	1.52	22.82	...	"	"
6.57	0.20	3.70	7.45	11.15	1.50	8.95	8.06	Wheat starch, clove stems and stone cells.	Tannin low. Foreign matter.
6.27	0.90	4.17	12.32	16.49	2.00	14.32	.....	Clove tissues and a few stone cells.	Acid insoluble ash. Small quantities of foreign matter.
6.00	0.27	4.37	15.47	19.84	2.32	17.79	...	Clove tissues.....	Genuine.

D. O'SULLIVAN, INSPECTOR.

5.67	0.50	3.67	17.75	21.42	1.75	19.50	...	Wheat starch and a few stems.	Foreign matter.
5.55	0.25	3.10	22.47	25.57	0.85	23.32	.....	Clove tissues.....	Genuine.
5.92	0.30	3.52	18.07	22.40	0.60	19.87	.....	" .....	"
5.72	0.12	3.67	11.37	15.09	1.32	12.60	.....	" .....	"
5.80	0.35	3.30	13.82	17.12	1.30	15.12	.....	" .....	"
7.02	0.17	4.00	14.70	18.70	0.95	15.65	...	"	"
5.10	0.25	3.22	19.27	22.49	3.50	22.77	.....	" .....	"
6.00	0.40	3.05	18.15	22.20	1.00	20.15	.....	" .....	"
4.80	0.20	3.25	24.52	27.77	1.05	25.57	12.96	"	"
7.23	0.90	3.65	12.75	16.40	0.85	13.00	...	"	Acid insoluble ash is high.